

**FACT SHEET FOR NPDES PERMIT NO. WA0037770**

**Cowlitz County - Toutle STP**

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## **INTRODUCTION**

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES) permits which is administered by the Environmental Protection Agency (EPA). The EPA has delegated responsibility to administer the NPDES permit program to the state of Washington on the basis of Chapter 90.48 RCW which defines the Department of Ecology's (the Department) authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the state include procedures for issuing permits (Chapter 173-220 WAC), technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC) and water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit.

This permit is issued to selected minor dischargers that, based on the available information, the Department believes have a relatively low environmental impact potential. The permit contains the technology-based effluent limitations as given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). Also, an engineering study assessing the discharge's potential for exceedance of the water quality standards was evaluated. Based on this evaluation and the Department's assessment of the discharge's potential for exceedance of the water quality standards, the permit contains a requirement to minimize chlorine usage.

One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

This fact sheet has been reviewed by the Permittee and errors in fact have been corrected. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments (Appendix C) will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Changes to the permit will be addressed in Appendix C--Response to Comments.

## **GENERAL INFORMATION**

Applicant	Cowlitz County Department of Public Works	
Facility Name and Address	Cowlitz County - Toutle Sewage Treatment Plant 200 South Toutle Road Kelso, WA 98649	
Type of Treatment	Activated Sludge Oxidation Ditch	
Discharge Location	Toutle River Latitude: 46° 19' 55" N                      Longitude: 122° 43' 30" W	
Water Body ID Number	WA-26-1050	

## BACKGROUND INFORMATION

### DESCRIPTION OF THE FACILITY

- 1- Treatment Processes: The wastewater treatment system consists of screening followed by biological treatment in an oxidation ditch and clarifier system. The treated effluent is chlorinated before discharging to Toutle River.
- 2- Treatment Plant Classification: Classification of this plant is II.
- 3- Industrial Users: According to the information provided by the applicant, there are no major industrial contributors to the applicant's sewer collection system.

### DESCRIPTION OF THE RECEIVING WATER

The facility discharges to Toutle River (WA-26-1050) which is designated as a Class A receiving water in the vicinity of the outfall. Characteristic uses include the following:

Water supply (domestic, industrial, agricultural); stock watering; fish migration; fish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

This water body is listed on the 1996 Section 303(d) list for fecal coliform, approved by EPA April 1, 1996.

### DISCHARGE OUTFALL AND DILUTION

Secondary treated and disinfected effluent is discharged from the facility via pipe and open channel flow to the Toutle River.

An estimate of the dilution factors based on the allowable percent flow of the receiving water was made for this discharge using the formula below. The receiving water flow data and the projected peak daily flow for the year 2017 were obtained from "OUTFALL EVALUATION FOR THE TOUTLE WWTP," Gibbs & Olson, Inc., Revised November 1996.

acute dilution factor =  $(Q_{\text{effluent}} + 2.5\% Q_{\text{stream}}) / (Q_{\text{effluent}})$

chronic dilution factor =  $(Q_{\text{effluent}} + 25\% Q_{\text{stream}}) / (Q_{\text{effluent}})$

where,  $Q_{\text{effluent}}$  = effluent flow. The actual peak day flow and maximum month flow during the critical condition are .145 MGD and .069 MGD, respectively.

$Q_{\text{stream}}$  = receiving water flow, 132.5 MGD.

From the above calculation, the estimated dilution factors at the edges of the acute and chronic mixing zones are 23.8 and 481, respectively.

### PERMIT STATUS

The previous permit for this facility was issued on January 28, 1980. The previous permit placed effluent limitations on 5-day Biochemical Oxygen Demand (BOD<sub>5</sub>), Total Suspended Solids (TSS), pH, and Fecal Coliform bacteria.

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An application for permit renewal was submitted to the Department on July 12, 1995, and accepted by the Department on December 1, 1995.

*PERMIT COMPLIANCE HISTORY*

Since January 1995, the Cowlitz County Toutle WWTP has violated the suspended solids weekly average 93 lb/day limit twice and the monthly average 62 lb/day limit twice. TSS concentration limits (30 and 45 mg/L) were exceeded three times during this same period, and there was one TSS percent removal violation. There were three fecal coliform bacteria weekly average violations. The monthly average pH fell within the permit lower limit of 6.5 and upper limit of 8.5, however, the daily minimum pH often falls below the permit's lower limit.

The last inspection of this facility was on June 27, 1996. A chronic filament problem, causing washouts in winter months, was noted. It was suggested the facility obtain a selector and additional solids handling equipment. More redundancy was suggested for reliability.

The Toutle outfall was damaged during Mount St. Helen's eruption in 1980. Permanent repairs and resubmersing the outfall in the Toutle River were not scheduled until the Army Corps of Engineers considered riverbed stable. A new outfall is due to be constructed September 1997. The outfall evaluation was approved January 24, 1997, and the plans and specifications were approved on June 12, 1997.

*WASTEWATER CHARACTERIZATION*

The concentration of pollutants in the discharge was reported in the NPDES application and in discharge monitoring reports. The effluent is characterized as follows:

**Table 1: Wastewater Characterization**

<u>Parameter</u>	<u>annual average</u>	<u>lowest monthly average</u>	<u>highest monthly average</u>
Flow (MGD)	0.089	0.048	0.11
BOD <sub>5</sub> (mg/L)	7.8	4.65	13.9
TSS (mg/L)	11.97	2.9	62
Fecal Coliform (colonies per 100 mL)			58.5
Total Residual Chlorine (mg/L)	0.69	0.51	0.8
Temperature (degree Fahrenheit)	52	46	58
pH range		low pH = 6.5	high pH = 7.5

**PROPOSED PERMIT LIMITATIONS AND CONDITIONS**

Federal and state regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC) or Sediment Quality Standards (Chapter 173-204 WAC). The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

<b>Parameter</b>	<b>Existing Permit Limits</b>	<b>Proposed Permit Limits</b>
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	Monthly Average	Weekly Average	Monthly Average	Weekly Average
	Technology Based Limits			
Flow	0.25 MGD		0.25MGD	
BOD	30 mg/L or 85 % removal 62 lb/day	45 mg/L 93 lb/day	30 mg/L or 85 % removal 62 lb/day	45 mg/L 93 lb/day
TSS	30 mg/L or 85 % removal 62 lb/day	45 mg/L 93 lb/day	30 mg/L or 85 % removal 62 lb/day	45 mg/L 93 lb/day
Fecal Coliform	200/100 mL	400/100 mL	200/100 mL	400/100 mL
pH	6 to 8.5 standard units		6 to 9 standard units	
	Water Quality Based Limits			
	Daily Max.		Daily Max.	
Chlorine	None		Minimized	

*DESIGN CRITERIA*

In accordance with Washington Administrative Code (WAC) 173-220-130(1)(a), effluent limitations shall not be less stringent than those based upon the design criteria for the facility, which are contained in approved engineering plans, reports, or approved revisions. Also, in accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The permitted maximum month (design) wastewater flow for the Cowlitz County Toutle WWTP facility is 0.25 MGD.

*TECHNOLOGY-BASED EFFLUENT LIMITATIONS*

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The permit requires that chlorine concentrations in excess of that necessary to reliably achieve the fecal coliform limits shall be avoided. The Water Pollution Control Federation's Chlorination of Wastewater (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/liter chlorine residual is maintained after fifteen minutes of contact time. See also Metcalf and Eddy, Wastewater Engineering, Treatment, Disposal and Reuse, Third Edition, 1991. A treatment plant that provides adequate chlorination contact time can meet the 0.5 mg/liter chlorine limit on a monthly average basis. This concentration shall be used as guidelines for minimizing chlorine usage.

*SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS*

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water

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Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state.

In the absence of data indicating otherwise, the discharge is believed to have a relatively low environmental impact potential and therefore, the permit does not have extensive effluent and receiving water data gathering and monitoring requirements. However, an assessment of the discharge's potential for exceedance of the water quality standards for chlorine and ammonia are made. Based on this preliminary evaluation, described in the following section, the permit may include monitoring and measures to control discharges of these toxic pollutants.

**CONSIDERATION OF SURFACE WATER QUALITY-BASED CRITERIA**

***Critical Conditions***

Determination of the reasonable potential for exceedance of the surface water standards quality standards are made for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

***Mixing Zones***

The Water Quality Standards allow the Department to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention and control (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

***Preliminary Dilution Factor Estimation***

When pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART, mixing zones may be authorized in accordance with Chapter 173-201A WAC.

Mathematical models and/or dye studies may be used to determine the dilution factors of effluent to receiving water that occur within the allowable mixing zones at the critical condition. The dilution factors determined will then be compared with those based on the allowable river flow percents (WAC 173-201). RIVPLUM4 model may be used to determine the dilution factors at the boundaries of the allowable mixing zone. RIVPLUM4 is a two dimensional model based on the assumption that the discharge is a single point source and is completely and rapidly mixed vertically in the receiving river. Under most discharge conditions dilution factors estimated by the percent method are more conservative (i.e., are less) than those predicted by RIVPLUM4. An outfall evaluation report entitled "OUTFALL EVALUATION FOR THE TOUTLE WWTP", Gibbs & Olson, Inc., Revised November 1996, used PLUMES's to model the Toutle's proposed outfall. The PLUMES is a computer program interface linking two computer models for predicting effluent mixing and dilution factors in ambient receiving waters. The computer modeling of the Toutle's proposed outfall predicts an acute dilution factor of 5.4, although based on Department review of the modeling assumptions (Norm Glenn, December 16, 1996), this number appears to be conservative and a dye study may be required to provide a better estimate of the available dilution. The dilution factor used in this permit is a preliminary estimate based on the percent flow method.

### ***pH Considerations***

The technology-based discharge standards for pH is 6 to 9 (Chapter 173-221 WAC). Based on the available information, discharge from this facility does not have a reasonable potential to violate the receiving water pH standards outside the allowable mixing zone so long as the technology based limit is met.

### ***Chlorine Considerations***

Discharges from wastewater treatment plants that use chlorine for coliform control are likely to have a reasonable potential for chlorine toxicity, unless, dechlorination or other chlorine control methods are practiced at the plant and there is adequate dilution of the effluent by the receiving water.

Based on the estimated acute dilution factor (23.8), discharge from these facilities does not have a reasonable potential to exceed the water quality standards for chlorine outside the allowable mixing zone. The permit requires that the Permittee shall not use chlorine concentrations in excess of that necessary to reliably achieve coliform limits in the permit.

### ***Ammonia Considerations***

A reasonable potential determination for exceedance of the ammonia criteria caused by this discharge can not be made without adequate data on the ammonia concentration in the effluent and data on the flow, temperature, pH, and ammonia concentration in the receiving water under the critical condition. Calculations of the ammonia criteria under various conditions suggest that there is no reasonable potential for exceedance of the water quality standards when the receiving water pH and temperature are below 8 and 20 degree C, respectively, and the acute dilution factor is greater than 10. However, as the background ammonia nitrogen concentration in the receiving water increases to 0.5 mg/L or higher, the reasonable potential analysis suggests the exceedance of the chronic ammonia criteria. If there are indications of high receiving water pH, temperature, or ammonia, the permit may require ambient flow and water quality monitoring.

Based on the preliminary estimate of the dilution factor, the discharge for this facility does not have a reasonable potential for exceedance of the ammonia criteria outside the allowable mixing zone in the receiving water.

## **MONITORING AND REPORTING**

Effluent monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

The monitoring and testing schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of the Department Permit Writer's Manual for oxidation ditch activated sludge systems.

The permit may require additional monitoring to determine the reasonable potential for exceedance of the ammonia criteria. The parameters to be monitored may include the ammonia concentration in the effluent, and the receiving water ammonia concentration, pH, and temperature.



## **OTHER PERMIT CONDITIONS**

### *PREVENTION OF FACILITY OVERLOADING*

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4. to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4. restricts the amount of flow. Also, the treatment plant has been experiencing excessive filamentous growth during wet seasons. This recurrent condition has caused the biological solids to washout of the treatment system, leading to high effluent TSS. Special condition S.1.C. requires the Permittee to carry out a diagnostic evaluation of the recurrent filamentous growth problem and propose correction measures.

### *OPERATION AND MAINTENANCE (O&M)*

The proposed permit contains condition S.5. as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

### *RESIDUAL SOLIDS HANDLING*

Excess sludge from the activated sludge process is further stabilized in the aerobic digester and applied to the sludge drying beds at the facility. The sludge drying beds do not operate well during wet seasons and become overloaded. The lack of adequate sludge processing limits the sludge wasting rates from the activated sludge oxidation ditch process. This will potentially lead to excessive sludge accumulation in the oxidation ditch and the clarifier, thus, interfering with proper solids clarification. The permit condition S4. requires the Permittee to plan for increasing the sludge processing capacity at the treatment plant.

To prevent water quality problems the Permittee is required in permit condition S7. to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and state Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503. The disposal of other solid waste is regulated by the jurisdictional health department.

### *OUTFALL EVALUATION*

Proposed permit condition S.9 requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers.

### *GENERAL CONDITIONS*

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual NPDES permits issued by the Department.

## **PERMIT ISSUANCE PROCEDURES**

### *PERMIT MODIFICATIONS*

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

### *RECOMMENDATION FOR PERMIT ISSUANCE*

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. The Department proposes that this permit be issued for five years.

### *REVIEW BY THE PERMITTEE*

A proposed permit was reviewed by the Permittee for verification of facts. Only factual items were corrected in the draft permit and fact sheet.

## **APPENDIX B--GLOSSARY**

**Acute Toxicity**--The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

**Ambient Water Quality**--The existing environmental condition of the water in a receiving water body.

**Ammonia**--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

**Best Management Practices (BMPs)**--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

**BOD<sub>5</sub>**--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD<sub>5</sub> is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

**Bypass**--The intentional diversion of waste streams from any portion of a treatment facility.

**Chlorine**--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

**Chronic Toxicity**--The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

**Class 1 Inspection**--A walk-through inspection of a facility that includes a visual inspection and some examination of facility records. It may also include a review of the facility's record of environmental compliance.

**Class 2 Inspection**--A walk-through inspection of a facility that includes the elements of a Class 1 Inspection plus sampling and testing of wastewaters. It may also include a review of the facility's record of environmental compliance.

**Clean Water Act (CWA)**--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

**Combined Sewer Overflow (CSO)**--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

**Composite Sample**--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

**Construction Activity**--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

**Critical Condition**--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

**Daily Maximum Discharge Limitation**--The greatest allowable value for any calendar day.

**Dilution Factor**--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction.

**Engineering Report**--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

**Fecal Coliform Bacteria**--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

**Grab Sample**--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

**Industrial Wastewater**--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

**Infiltration and Inflow (I/I)**--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of rainfall-caused surface water drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

**Mixing Zone**--An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (Chapter 173-201A WAC).

**Monthly Average Discharge Limitation**--The average of the measured values obtained over a calendar month's time.

**National Pollutant Discharge Elimination System (NPDES)**--The NPDES (Section 402 of the Clean Water Act) is the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the state of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington state permit writers are joint NPDES/State permits issued under both state and federal laws.

**pH**--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

**State Waters**--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

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**Stormwater**--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

**Technology-based Effluent Limit**--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

**Total Suspended Solids (TSS)**--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

**Upset**--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

**Water Quality-based Effluent Limit**--A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

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*APPENDIX C--RESPONSE TO COMMENTS*